

Causes of Death Among College Students

—A Study of 209 Deaths at Yale University, 1920–55—

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WHAT DISEASES and conditions kill our college students? How does mortality among them compare with that of the general population of the same ages? Are there specific diseases to which college students are more prone to succumb?

In answer to these questions, I submit the results of a study of deaths among the students at Yale University during the period 1920 through 1955. The causes of death among these students are set forth, and they are compared with the causes reported for other college groups and for the total population of the United States. It is hoped that these data will focus attention on some of the important student health problems and that they will emphasize the necessity for action on the part of colleges and universities in fulfilling their responsibility for student health needs.

Study Materials and Methods

The files of the department of university health, the department of mental hygiene and psychiatry, and the alumni records office of Yale

University were the primary sources of information. A student death was defined to include students who died during the academic year or summer vacation and those on medical or psychiatric leave of absence who died within 1 year after withdrawal. Calendar years, instead of academic years, were used to record the year of death.

To confirm the death and to determine the cause, the individual medical records at the department of university health were examined first. For students who died as a result of suicide and who had been seen in the department of mental hygiene and psychiatry, the records of that department were studied.

The hospital and autopsy reports of 23 students who died from medical and surgical diseases, or their complications, at the New Haven Hospital were also examined. Several errors in the original data were found and corrected on the basis of these records. Autopsy findings were used to correct clinical diagnoses whenever such findings were available.

Much valuable information was obtained from the individual records of the deceased in the alumni records office. For most of the students who died, these records contained the date of death or of withdrawal for medical or psychiatric leave of absence and a statement of the cause of death from the registrar of vital statistics in the town where death occurred. For most of those who died from accidents or suicides, they also contained newspaper clippings concerning the incident.

The name of any student who could not be

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traced by one of the above methods was submitted to the registrar of vital statistics in the town where death occurred. The deaths of 21 students were confirmed in this manner.

Information concerning the cause of death was obtained from one or more of the above sources for 207 of 209 student deaths. For one student who died abroad, death was reported as accidental without specific details, and the cause of death for another student could not be determined.

The data collected on each student death included the name and class of the student, the date of death, the age at the time of death, the cause of death, and the place where death occurred. Additional information on accidental deaths and suicides was obtained from newspaper clippings describing the circumstances of the death.

Statistical Results

There were 209 deaths among the students at Yale University from 1920 through 1955, an average of slightly less than 6 each year. The only year in which no deaths occurred was 1920. The largest number of students died in 1949, when 16 deaths were recorded.

Of the 209 students, 86 percent were 15-24 years of age, 13 percent were 25-30 years, and 1 percent were over 30 years. Ninety-five percent were white males, and 5 percent were white females.

The five leading causes of death among the Yale students were accidents (43.8 percent), suicide (12.0 percent), heart and circulatory diseases (7.7 percent), pneumonia (7.2 percent), and infections of the central nervous system (6.3 percent). Of the accidental deaths, more than half were caused by motor vehicle accidents. The only other data available on deaths among college students are those reported by Diehl and Shepard from a study of deaths in 327 students at 9 universities during the period 1925-35 (1). In that study, the five leading causes were accidents (26.3 percent), heart and circulatory diseases (10.1 percent), suicide (8.0 percent), pneumonia (7.3 percent), and tuberculosis (6.4 percent). Again, motor vehicle accidents were the cause of more than half of the accidental deaths. The data on cause of death

Table 1. Causes of death among Yale students, 1920-55, and other college students, 1925-35

Cause of death	Yale students		Other college students: ¹ percent of deaths
	Number	Percent	
Accidents.....	91	43.8	26.3
Automobile.....	49	23.6	15.9
All others.....	42	20.2	10.4
Suicide.....	25	12.0	8.0
Heart and circulatory diseases.....	16	7.7	10.1
Pneumonia.....	15	7.2	7.3
Infections of the central nervous system.....	13	6.3	4.6
Malignant neoplasms.....	11	5.3	2.8
Septicemia.....	7	3.4	4.6
Leukemia.....	6	2.9	1.5
Tuberculosis.....	5	2.4	6.4
Nephritis.....	5	2.4	1.8
Appendicitis.....	4	2.0	4.0
Other causes.....	10	4.8	22.4
Cause unknown.....	1	0.5	0

¹ Reference 1.

obtained in these two studies are given in table 1.

Since 95 percent of the Yale students who died were white males and 86 percent of them were in the 15-24 age group, the deaths at Yale are compared with the deaths among white males aged 15-24 years in the total population of the United States. From the national death rates for this group, the number of deaths expected among Yale students each year of the study period was calculated. The results, presented in table 2, reveal that the number of deaths at Yale was lower than the number expected for every year except 1949. That year an airplane disaster in Seattle, Wash., took the lives of 11 students.

To compare the causes of death among Yale students with the causes for the total population, 1950 rates for white males aged 15-24 years as reported by Collins and his associates were used (2). Since there was only one death at Yale in 1950, these rates were applied to student deaths during the period 1946 through 1955. As shown in table 3, for only two causes was the number of deaths among Yale students above expectation. They were suicides, with 5.1 deaths expected and 7.0 deaths observed, and cerebral hemorrhage, with 1.2 deaths expected and 2.0 deaths observed. Neither of these val-

Table 2. Comparison of number of deaths expected if national death rates had prevailed with number of deaths observed among Yale University students, 1920-55

Year	National death rate per 1,000 population ¹	Number of students registered at Yale	Number of deaths expected	Number of deaths observed
1920-----	4.2	3,563	15.0	0
1921-----	3.4	3,875	13.2	7
1922-----	3.3	4,235	14.0	7
1923-----	3.4	4,490	15.3	7
1924-----	3.2	4,500	14.4	8
1925-----	3.2	4,796	15.3	9
1926-----	3.2	5,216	16.7	10
1927-----	3.0	5,438	16.3	6
1928-----	3.2	5,583	17.9	14
1929-----	3.2	5,663	18.1	5
1930-----	3.0	5,963	17.9	6
1931-----	2.9	6,049	17.5	1
1932-----	2.6	5,864	15.2	6
1933-----	2.5	5,723	14.3	7
1934-----	2.6	5,553	14.4	12
1935-----	2.6	5,418	14.0	10
1936-----	2.6	5,427	14.1	8
1937-----	2.5	5,488	13.7	4
1938-----	2.1	5,560	11.7	6
1939-----	2.0	5,692	11.4	7
1940-----	2.0	5,745	11.5	3
1941-----	2.1	5,719	12.0	2
1942-----	2.1	5,574	11.7	4
1943-----	2.5	5,267	13.2	2
1944-----	2.7	4,568	12.3	1
1945-----	2.6	3,709	9.6	1
1946-----	2.0	6,048	12.1	7
1947-----	1.8	8,862	16.0	5
1948-----	1.7	9,004	15.3	3
1949-----	1.6	8,768	14.0	16
1950-----	1.5	8,256	12.4	1
1951-----	1.6	7,716	12.2	3
1952-----	1.6	7,627	12.2	6
1953-----	1.6	7,558	12.1	4
1954-----	1.5	7,553	11.3	6
1955-----	² 1.6	7,555	12.1	4

¹ Rates for white males aged 15-24 years, published by the National Office of Vital Statistics in: Vital Statistics of the United States, 1950, vol. 1, p. 194; Annual Summary for 1954, part 2, Monthly Vital Statistics Report, vol. 3, No. 13, May 13, 1955; Annual Summary for 1955, part 2, Monthly Vital Statistics Report, vol. 4, No. 13, May 28, 1956.

² Estimated.

ues is statistically significant according to the chi-square test.

The vital statistics of the United States during the past half century reflect some striking changes in causes of death. Of the 10 leading

causes in 1900, 5 were communicable diseases. Pneumonia and influenza ranked first; tuberculosis, second; diarrhea and enteritis, third; diphtheria, ninth; and meningitis, tenth. In 1955, only one of these, pneumonia and influenza, was among the first 10 and none was among the first 5 (3).

To determine the trend in causes of death among Yale students, the numbers of deaths from accidents, infectious diseases (including pneumonia, meningitis, septicemia, tuberculosis, encephalitis, poliomyelitis, and others), and suicides were plotted for 10-year periods, as shown in the chart. Deaths due to infectious diseases have declined steadily. Accidents have remained at a high level and have been the most prominent cause of death in students since the decade 1930-39. The number of suicides rose sharply during the decade 1930-39, the depression years, then declined during the next decade, the war and postwar years.

Discussion

The finding that mortality among the students at Yale University is generally much

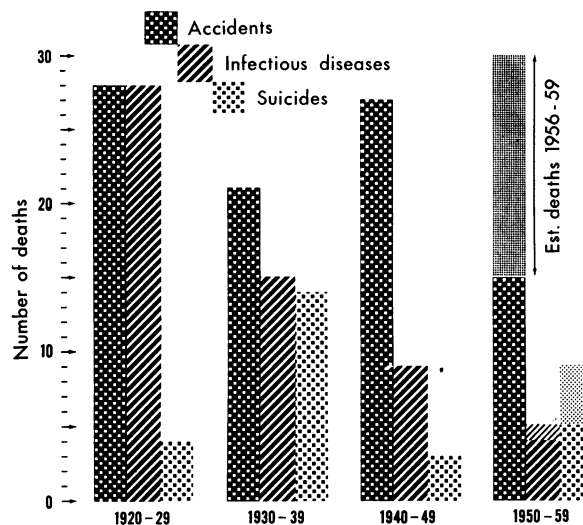
Table 3. Comparison of number of deaths expected if national death rates had prevailed with number of deaths observed among Yale University students, by cause of death, 1946-55

Cause of death	National death rates per 100,000 population ¹	Number of deaths expected ²	Number of deaths observed
Accidents-----	91.9	72.6	38
Malignant neoplasms other than leukemia-----	7.7	6.1	4
Diseases of the heart-----	5.8	4.6	1
Tuberculosis (all forms)-----	4.3	3.4	0
Suicide-----	6.6	5.2	7
Pneumonia-----	2.6	2.1	1
Acute poliomyelitis-----	2.3	1.8	1
Cerebral hemorrhage-----	1.6	1.3	2

¹ 1950 rates for white males aged 15-24 years, as reported by Collins, Lehmann, and Trantham (ref. 2).

² Based on total student population of 78,947 for the 10-year period, as determined by adding annual registration figures.

Number of deaths from accidents, infectious diseases, and suicide among Yale University students for 10-year periods, 1920-59



lower than that of the general population of the same ages is not unexpected, for several reasons: College students, for the most part, are adolescents and young adults in good health. The majority of the students at Yale are from an average or an above average socioeconomic group. Most of them eat in the college dining halls, where well-balanced meals are served. Yale students are a selected intellectual group, who are probably better informed about health matters than the general population of the same ages. College entrance physical examinations help detect disease and single out for special care students with medical problems. Complete medical care is available to all students 24 hours a day, 7 days a week, while school is in session.

This study clearly points to accidents as the number one health problem among college students, just as they are in the general population in the age group 15-24 (4). At Yale, accidents accounted for more deaths than the next five most common causes combined. Accidental deaths have continued at a high peak, while deaths due to infectious diseases have been on the decline. There are no reliable statistics regarding the incidence of accidents at Yale, but preliminary data suggest that 1 Yale student in 4 has an accident requiring medical treatment each year.

In the general population, motor vehicle accidents cause more deaths than any other type of accident among persons under 65 years of age (4). This proved true at Yale, where 23.6 percent of all deaths were caused by motor vehicle accidents. Most of the motor vehicle deaths occurred outside Connecticut, and most of the ones in Connecticut happened outside New Haven. Closely related to these findings is the fact that most of the fatal motor vehicle accidents took place over the weekend. Since Yale is primarily a men's college and since there are no girls' schools in the immediate vicinity, many of the undergraduate students travel long distances in automobiles over the weekend to see young ladies. Other students drive home to spend the weekend with their families.

Suicide was the second most common cause of death among Yale students. The number of suicides was highest during the depression years and lowest during and immediately following World War II, a pattern which is consistent with the pattern of suicidal deaths for the general population. There is no clear explanation for this phenomenon, but some authorities feel it is because the potentially suicidal individual diverts his thoughts, and his pent-up anger, from himself to the war effort and the potential enemy.

Most of the causes of death among college students are amenable to prevention and treatment programs. Communicable diseases are today readily controlled with antibiotics. Through health education, it should be possible to prevent many accidents. With the provision of adequate psychiatric counseling, it may be possible to reduce the number of suicides. Promotion of mental health is an important function of any college health department, since it has been estimated that about 10 percent of the students need professional help with their emotional problems (5).

The college situation affords unusual opportunities for a productive campaign against accidents. College students are in a learning situation; they are maturing individuals; and they are congregated together where they can be reached. As a result of this study of deaths at Yale, plans are now being made for an investigation of accident morbidity at the university. This investigation should provide

information around which a preventive educational campaign can be constructed.

American colleges and universities have an obligation, a duty, to protect and promote the health of their students. Are our institutions of higher learning fulfilling this obligation? It is estimated from a 1953 survey of 1,157 colleges that of every 3, 1 has no clinical service, 1 has clinical services for minor disorders, and 1 has clinical facilities for both major and minor disorders (6). Thus, it appears that there is a definite need to stimulate the interest of administrators, teachers, trustees, and parents in health and medical facilities for college students.

Summary

1. In a study of the 209 student deaths at Yale University from 1920 through 1955 the following were found to be the most common causes of death: accidents (43.8 percent); suicide (12.0 percent); heart and circulatory diseases (7.7 percent); pneumonia (7.2 percent), and central nervous system infections (6.3 percent).

2. Deaths from infectious diseases have decreased, but accidental deaths have remained high. Accidents have been the number one

killer of college students since the decade 1930-39.

3. The number of deaths among the Yale students was lower than would be expected if national death rates had prevailed. There were more suicides among the students than would be expected, but the difference was not statistically significant.

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Porterfield Named Assistant to the Surgeon General

Dr. John D. Porterfield, a career officer of the Public Health Service since 1939, assumed his duties as assistant to the Surgeon General on October 16, 1956.

He comes to his new position from Ohio where he was director of the Ohio State Department of Health from 1947 to 1954 and director of the Ohio Department of Mental Hygiene and Correction since 1954.

In his new assignment, Dr. Porterfield will give particular attention to the fields of chronic disease and aging.

He is chairman of the editorial board of the American Journal of Public Health; chair-

man of the mental health section of the American Public Health Association; former secretary and later chairman of the association's health officers section; former secretary and later vice president of the Association of State and Territorial Health Officers, and a member of the Scientific Study and Planning Committee of the Joint Commission on Mental Illness and Health. He also is associate professor of preventive medicine at the Ohio State University Medical School at Columbus and a visiting lecturer at the University of Michigan School of Public Health at Ann Arbor.